

§Appl. No. 10/009,614
Amdt. dated June 1, 2004
Reply to Office Action of, January 29, 2004

REMARKS

New independent apparatus claims 13 and 14 with dependent claims 2-6, depended from claim 14 and dependent claims 9-12 depended from claim 13 as well as new method claim 15 with dependent method claims 16-18 remain in this application for examination.

Applicants appreciate the indication of allowability of claims 7 and 8, however these claims have been cancelled without prejudice and new independent claims 9 and 10 have been added.

Applicants have entered headings into the specification with the understanding that the headings are entered at the Examiner's suggestion and do not comprise claim limitations, but are simply reading aids with no legal effect.

With respect to paragraph 3, Applicants submit herewith formal drawings incorporating the proposed corrections filed with the previous amendment on October 23, 2003.

Claims 2-7 have been rejected under 35 U.S.C. §103(a) as unpatentable over Elwenspoek et al. in view of Parce et al. '231.

Before setting forth the reasons as to why Applicants' claimed apparatus distinguishes over the references applied by the Examiner, Applicants are of the opinion that it would be helpful to explain the significance of Applicants' disclosure upon which the invention is based. The claimed apparatus provides an analytical unit comprising a very simple, elegant structure for defining a selected sample volume, or selected sample volumes. This is accomplished by the claimed sample receiving channel section with fluidic connections at opposite ends which defines a specific channel volume. In chemical analysis it is important to know the exact volume of a sample applied to an analytical system. Due to the small dimensions of miniaturized analytical systems it is difficult to provide small sample volumes which are larger than the sample volumes obtainable by electrokinetic injection. Electrokinetic connection is not suitable to simply move a volume of liquid because it always additionally changes the composition of the sample and initially separates it. Applicants are interested in obtaining a miniaturized sample above a minimum volume defined as

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being greater than 0.01 μ l in claim 13 and in the range of 0.01 μ l to 100 μ l in claim 14. Electro-kinetic separation is not a viable method of obtaining samples of this size but in practice is applicable to only much smaller volumes.

In Applicant's new claims 9 and 10, a miniaturized analytical system includes an apparatus for delivering defined sample volumes greater than 0.01 μ l, wherein the apparatus comprises at least one sample receiving section. The Examiner's attention is directed to Figs. 2A and 2B where a sample receiving section K1 is disposed between two ends at F1 and F2, the two ends F1 and F2 being fluidic connections which are openable and closable to admit a sample of fluid that fills the sample receiving channel section K1. In order to define the specific sample volume, buffer liquid which is initially in the sample volume section K1 is displaced by injecting or pumping a portion of the fluid to be sampled through either an F1 or F2 opening to displace the buffer fluid out of the sample section K1 through the other end of the sample section. For example, if F1 is used to inject the samples fluid, then F2 is open so that the buffer solution will flow either out of the channel system though F2 or be displaced into the channel section K2 and out of one of the other connections such as the connection F4. The buffer fluid exerts a back pressure against the samples of fluid flowing into K1. When K1 is filled, the connections F1 and F2 are closed. This defines the sample volume in a simple, elegant matter without relevant amounts of the sample being introduced into other portions of the channel system.

Elwenspoek et al. does not disclose a miniaturized analytical system including an apparatus for delivering defined sample volumes greater than 0.01 μ l. Rather, Elwenspoek et al. is directed to a fluidic logic element used in a logic block. In Elwenspoek et al. there are no fluid connections disclosed which might be closed, rather only inlet and outlet ports are disclosed. Accordingly, Elwenspoek does not disclose each limitation of claims 13 and 14 because there is no structure which allows one to define a sample volume in the fluid channel. In Elwenspoek et al. the channel 14 is not closed so that amounts of the sample go into other portions of the system. There is absolutely no disclosure in Elwenspoek of sealing off the channel 14 a result accomplished by

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Applicant's fluidic connections which open and close at the ends of the channel sections.

Elwenspoek et al simply does not disclose Applicant's claimed concept of an apparatus for delivering a defined sample wherein the apparatus includes at least one sample receiving channel section defining said sample volume. The dosage in Elwenspoek et al. is not defined by a sample receiving channel section. Elwenspoek et al. does not use a sample receiving section to determine volume, rather any structure in Elwenspoek et al. that might correspond to Applicant's claimed sample receiving section is a section which contains a flow sensor so that a volume of a dosage is not determined by the section since material continuously flows through the corresponding channel of Elwenspoek et al. In Elwenspoek et al. the size of the sample is not determined by closing both ends of a channel section when the channel section is full, but rather by the arrangement that checks the liquid into the corresponding section.

Parce et al. '231 does not cure the deficiencies of Elwenspoek et al. as a reference against Applicants' claims because there is no disclosure in Parce et al. of a sample receiving channel section defining the volume of a sample. Accordingly, this combination of references does not establish a *prima facie* case of obviousness and should be withdrawn.

Claims 2-6, depended from claim 14 and claims 9-12 depended from claim 13, patentability distinguishes over the combination of Elwenspoek et al. and Parce et al. '231 for the same reasons as independent claims 13 and 14 patentably distinguish over these applied references because dependent claims further limit the independent claims.

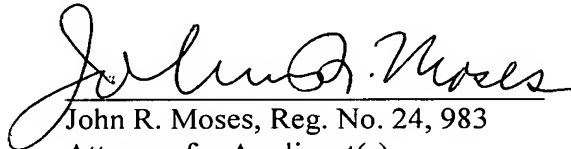
New method claims 15-18 include the concept of displacing a buffer liquid from a sample receiving channel section in order to provide a sample of a selected volume in a range of 0.01µl to 100µl. These claims distinguish over the references applied in the last Office Action for the same reasons that claims 13 and 14 distinguish.

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In that this is a full and complete response to the Office Action dated January 29, 2004, this application is now in condition for allowance and such allowance is hereby respectfully requested. If there are any remaining issues which could be expedited by a telephone conference, the Examiner is courteously invited to telephone counsel at the number indicated below.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,


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